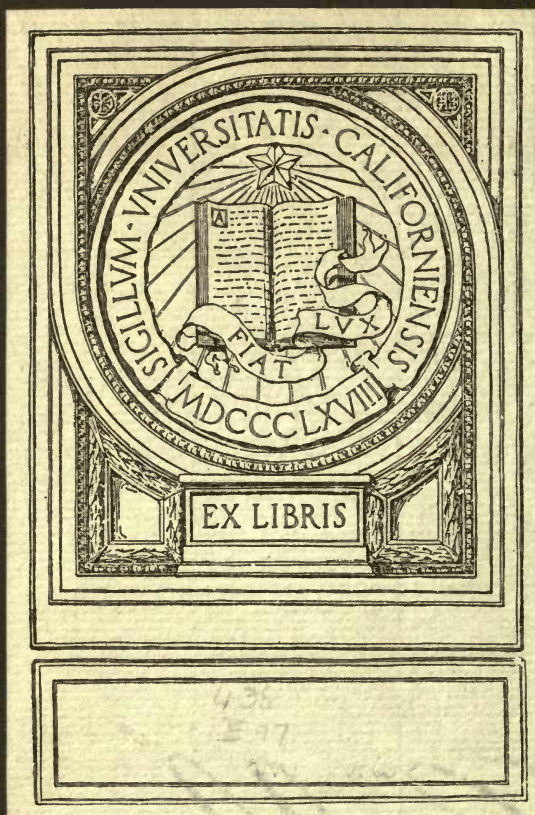


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THE
MINERALOGY
OF
PENNSYLVANIA
PART TWO

JOHN EYERMAN



THE UEBERROTH ZINC MINE, FRIEDENSVILLE, LEHIGH CO.
PHOTOGRAPH TAKEN BY JOHN EYERMAN.

TO WHOM
ATTACHED

THE
MINERALOGY
OF
PENNSYLVANIA

PART TWO
CHEMICAL ANALYSES

JOHN EYERMAN

UNIV. OF
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INTRODUCTION

WHEN Part One was issued, more than a generation ago, I had in mind that Part Two would be the final one and contain all available data, descriptive, chemical, crystallographic; the enforced, very intermittent work in my laboratory has made this impossible, and coupled with the loss, by fire, of the records of quite a hundred analyses, has further added to the disappointment.

While much descriptive matter is available, there is not sufficient to justify the publication of a final volume; however I have thought it desirable to record the analyses at hand and am therefore issuing this as Part Two, Chemical Analyses and New Localities.

With a few exceptions, I have omitted the Philadelphia zone localities, as an excellent directory of this prolific zone has recently been issued by Bengé and Wherry.

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THE MINERALOGY OF PENNSYLVANIA: PART II.

ORTHOCLASE. 313.

490: The gneiss-syenite of the Weygat, Easton; pink crystals

425: Lenni, Delaware county; light green crystals.

426: Rocksville, Bucks county; light green crystals.

A: No. 1 shaft, St. Peter's, Chester county; radiating, columnar crystals of light green to pink color. (F. A. Genth).

I have found a small amount of MnO in the green variety.

B: P & R mine, Siesholtzville, Berks county. (W. Headden)

	490	425	426	A	B
G	2.597	2.569	2.576	2.528	
SiO ₂	66.14	63.48	62.95	62.68	66.86
Al ₂ O ₃	18.96	20.14	16.69	20.90	18.97
Fe ₂ O ₃	0.62	1.31	1.40	0.23	0.62
Na ₂ O	3.00	4.98	6.94	—	3.61
K ₂ O	10.79	9.42	12.44	15.92	10.04
Ign	0.40	0.35	0.20	0.67	—
	99.91	99.68	100.62	100.40	100.10

OLIGOCLASE. 317.

Analyses of a specimen of whitish color from Gillespie's mill, Kellyville (415), and one of brownish white from Black Horse, Media (C), Delaware county, are given under microcline.

MICROCLINE. 315.

210: Johnson's quarry, Elam, Delaware county; in appearance, like the Branchville, Conn. mineral,

424: Vanartsdalen quarry, Bucks county; whitish crystals, associated with wernerite.

G	210 2.571	424 2.581	415 OLIGOCLASE	C†
SiO ₂	65.38	62.45	64.53	58.62
Al ₂ O ₃	18.92	16.22	27.36	23.55
Fe ₂ O ₃	0.77	0.54	1.30	0.17
CaO	—	0.52	—	3.23
BaO	—	—	—	2.54
Na ₂ O	1.98	4.95	0.20	3.68
K ₂ O	12.37	14.88	5.80	7.06
Ign	0.45	0.91	0.69	1.49
	99.87	100.47	99.88	100.36

PYROXENE. 325.

102: *Diopside*, of grayish-green color; vitreous to pearly lustre; found in 1856, and originally labeled *Sahlite*, Easton.

213: *Diopside*, radiating, of apple-green color, from Bailey's, Unionville, Chester county.

425: *Diopside*, with titanite; Vanartsdalen quarry, Bucks.

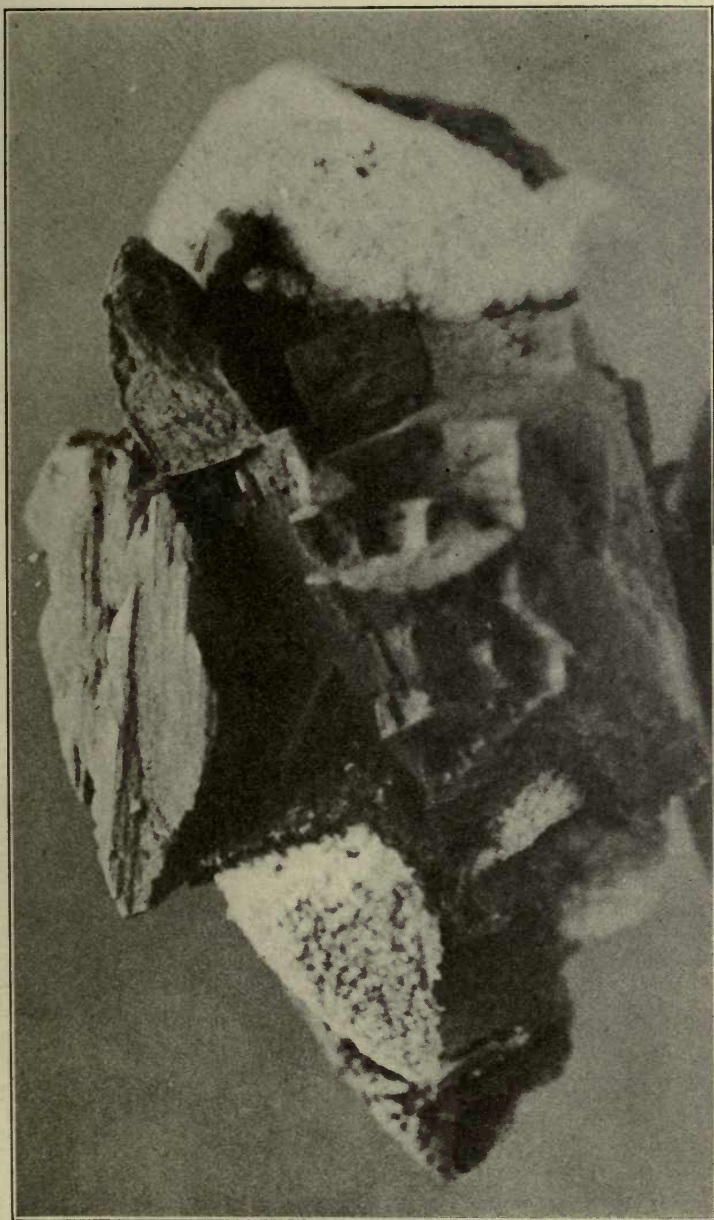
195: *Diopside*, a group of eight sided, greenish prisms; originally labeled, *Augite*, Easton.

D: *Augite*, Siesholtzville, Berks county. (S. Castle).

G	102 3.411	213	435 3.331	195 3.111	D
SiO ₂	51.05	52.56	47.80	53.39	49.30
TiO ₂	—	1.34	0.21	—	—
Al ₂ O ₃	0.73	0.86	—	0.73	14.98
Fe ₂ O ₃	—	—	—	1.67	0.53
FeO	—	1.30	14.91	0.97	6.02
CaO	24.59	25.20	23.01	24.30	21.45
MgO	23.80	18.00	12.65	17.98	8.27
Na ₂ O	—	—	0.71	—	—
H ₂ O	0.14	1.25	0.48	1.02	—
	100.31	100.51	99.77	100.06	100.55

PECTOLITE. 330.

This mineral has been found in the gneiss at Barber's quarry Frankford and at Harris' quarry, Upland, Delaware county.



Microcline: *var* Chesterlite. Newlin, Chester Co.

AMPHIBOLE. 338.

At Chestnut Hill, Easton, this species is the primary or base which has altered to form a number of secondary minerals, serpentinite, talc, etc; specimens which exhibit this alteration are of frequent occurrence; pseudomorphs are the rule.

The so-called *fibrous jade* is not a silicate, but an altered calcite. The St. Peter's *byssolite* is found in acicular crystals, penetrating calcite, and sometimes containing cobalt and nickel.

416: *Tremolite*, silky-white; semi-fibrous; Pusey's quarry, Kenneth Square, Chester county.

10: Altered, very hydrous; Oakford, Bucks; corresponding to Thomson's variety from New York. (*Min. i*, 209, 1836).

15: *Actinolite*, in grayish-green banded crystals; Easton.

401: *Actinolite*, in green blades. Mineral Hill, Delaware.

123: *Nephrite*, green bladed. Syenite ridge, Easton.

16: *Asbestus*, Delaware river quarries, Easton.

G	416 2.998	10	15	491	123 3.010	16
SiO ₂	57.16	54.46	54.35	56.34	60.26	55.25
Al ₂ O ₃	—	1.14	—	1.49	2.57	—
FeO	0.42	4.65	2.27	5.32	1.85	2.18
CaO	14.00	0.67	13.43	11.63	13.40	12.66
MgO	26.08	16.00	28.05	21.99	20.05	30.19
Ign	2.50	22.73	1.25	3.32	2.29	—
	100.16	99.65	99.35	100.09	100.42	100.28

BERYL. 344.

291: Yellow-green crystal. Chester city quarry.

306: Yellow-green crystal. Broad and Olney sts. Philadelphia.

311: Dark greenish blue crystals. Smedley farm, Middletown, Delaware county.

G	291 2.650	306 2.691	311 2.680
SiO ₂	66.00	66.71	65.79
Al ₂ O ₃	17.60	16.10	15.53
Fe ₂ O ₃	4.98	1.87	1.64
BeO	10.53	12.90	13.85
Ign	0.95	2.08	3.07
	100.06	99.66	99.88

CANCRINITE. 360.

This beautiful mineral has been found near Lamborn's mill, Kenneth Square, Chester county.

GARNET. 370.

431: *Grossularite*, light yellow-brown, associated with *thulite*; Leiperville, Delaware county.

20: *Almandite*, Bishop's mill, Middletown, Delaware county; a truncated dodecahedron, weighing ten ounces.

420: *Almandite*, Lafayette, Montgomery county.

590: *Almandite*, altered; dull brown; Rocksville, Bucks.

19: *Andradite*, St. Peter's; usually truncated; no striations. dark brown color and resinous fracture.

405: *Andradite*, Weber farm *allanite* locality, Lower Saucon tsp. Northampton county; dark brown.

	431	20	420	500	19	405
C	3.638	3.991	4.091	3.881	3.719	3.790
SiO ₂	38.74	36.22	37.03	41.69	35.42	35.46
Al ₂ O ₃	18.70	24.58	19.53	20.19	8.51	7.50
Fe ₂ O ₃	2.99	—	28.71	22.69	21.04	26.04
FeO	—	30.71	—	13.01	—	—
MnO	1.05	8.97	1.51	—	9.88	1.14
CaO	37.77	—	5.94	1.99	25.67	29.60
MgO	—	—	6.90	—	—	—
Na ₂ O	0.19	—	—	—	—	—
Ign	0.59	—	0.41	1.09	—	—
	100.03	100.48	100.03	100.66	100.52	99.74

ZIRCON. 394.

Without doubt, the most interesting, as well as the largest, zircons, found in the State, are those which were discovered many years ago, in the biotite at Easton; approximately, two dozen isolated crystals were found. Eight in my possession, are elongated prisms $m[110\ 1]$, with $p[111,1]$; some double. Color: clove-brown: the termination on the largest crystal is very black-brown, the prism face m clove-brown, the two being sharply separated by the angle line. The lengths are

$m-p$	=	15mm	m	=	7mm	$m(p)2$	=	15mm
m	=	5mm	m	=	5mm	$m(p)2$	=	17mm

WERNERITE. 387.

304: An altered scapolite of lavender-pink color from Mineral Spring quarry, Easton.

423: Vanartsdalen quarry, Bucks; grayish-blue with graphite

	304	423
G	2.610	2.689
SiO ₂	54.61	49.01
Al ₂ O ₃	24.79	26.77
Fe ₂ O ₃	0.32	—
FeO	—	0.39
CaO	2.06	16.89
MgO	9.01	—
Na ₂ O	4.41	3.30
K ₂ O	1.25	1.80
H ₂ O	1.76	1.70
Cl	2.00	—
	100.21	99.86

TOPAZ. 397.

Some years ago, I found a group of small, transparent prisms of yellow color, on syenite, at Chestnut Hill, Easton; this, I believe, is the first reported occurrence of topaz in the State.

CYANITE. 400.

215: Moore's, Delaware county; light to dark blue.

310: Cope's bridge, East Bradford, Chester county; grayish-green crystals.

501: Cope's bridge; light green to blue-green bladed prisms.

	215	310	501
G	3.621	3.569	3.600
SiO ₂	38.01	35.63	37.96
Al ₂ O ₃	60.86	58.65	60.80
Fe ₂ O ₃	1.16	4.91	1.30
Ign	0.61	—	—
	100.64	99.19	100.06

GADOLINITE. 404.

This complex mineral has, apparently, been found in the pegmatite, at McKinney's quarry, Germantown, but on account of the limited amount of material, I have been unable to absolutely identify the species, new to the State, but I have established the presence of Yttrium and Beryllium.

ZOISITE. 406.

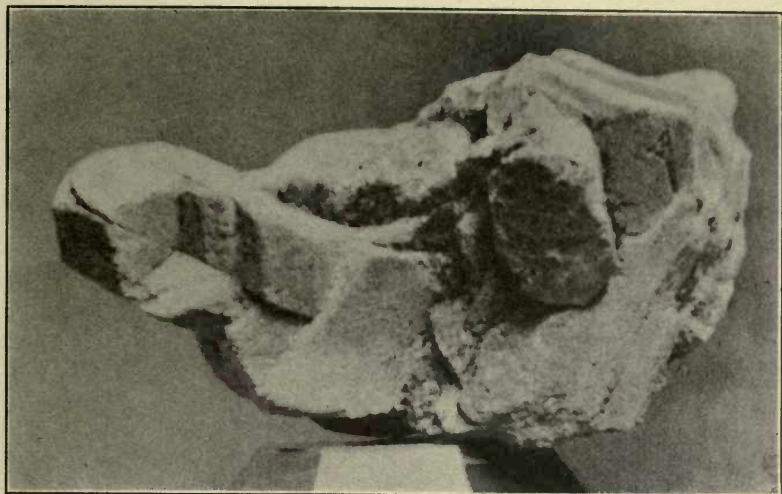
In my collection, there is a unique specimen which was found at the Bath Spring, West Chester (414), seventy-five years ago, and consists of a flat group of radiating, prismatic crystals of brown color; I have, also, analyzed the *thulite*, from Leiperville (202).

	202	414
G	3.519	3.831
SiO ₂	41.72	41.01
TiO ₂	tr	—
Al ₂ O ₃	30.20	30.25
Fe ₂ O ₃	3.19	—
FeO	0.18	1.14
MnO	tr	—
CaO	22.29	24.30
MgO	tr	tr
H ₂ O	2.21	2.62
	99.79	99.32

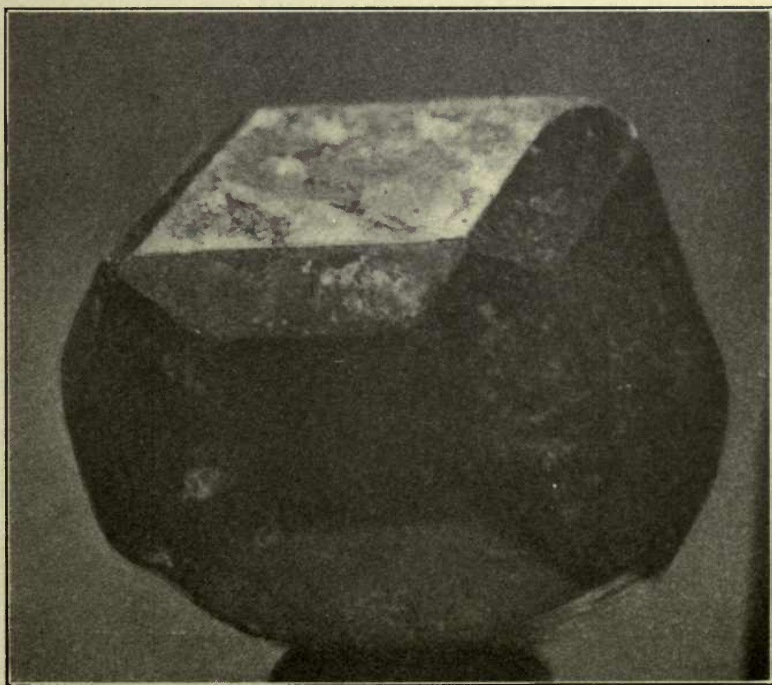
PREHNITE. 411.

An analysis of a light green specimen from Rockhill, Bucks, afforded,

	309
C	2.981
SiO ₂	42.99
Al ₂ O ₃	21.12
Fe ₂ O ₃	2.85
MnO	tr
CaO	27.97
H ₂ O	4.57
	99.50



Microcline. (twin). Smedley's, Middletown, Delaware Co.



Garnet: *var* Almandite. Bishop's Mill, Delaware Co.

EPIDOTE. 407.

409: Nodular in shale; near Perkasio, Montgomery county.

410: Olive-green; Kober's copper mine, Sumneytown, Montgomery county.

418: Dark olive-green crystals; Clark's quarry, Frankford.

101: Marble Mountain, N. J. opposite Easton.

	409	410	418	101
G	3.397	3.491	3.401	
SiO ₂	38.98	40.00	37.77	39.37
Al ₂ O ₃	25.29	22.03	23.20	20.99
Fe ₂ O ₃	8.25	20.24	10.57	14.83
FeO	1.11	0.73	0.82	0.63
MnO	0.13	0.56	0.59	0.52
CaO	23.29	16.10	23.55	23.05
H ₂ O	2.23	1.10	3.23	1.31
	99.28	100.76	99.73	100.70

PIEDMONTITE. 408.

This mineral is found, penetrating scheelite, at Musser's, in Buchanan valley; north of Monterey station and at other places in the rhyolite of South mountain. I have made a partial analysis of the radiating, red-brown crystals from Jack's Mt.

	407
SiO ₂	41.74
Al ₂ O ₃	22.75
Fe ₂ O ₃	6.79
MnO	6.95
Ce ₂ O ₃ <i>et al</i>	n.d.
CaO	18.37
H ₂ O	3.00
	99.60

CALAMINE. 423.

I give, herewith, analyses of this valuable zinc ore, from two well-known localities,

98: Ueberroth mine, Friedensville, Lehigh county.

99: Wheatley mine, Phoenixville, Chester county.

	98	99
G		3,409
SiO ₂	24.32	24.27
Fe ₂ O ₃	2.12	1.96
ZnO	65.05	65.90
H ₂ O	7.86	7.80
	99.35	99.93

ALLANITE. 409.

Occasionally found in isolated crystalline masses of sub-metallic lustre at Hoffman's quarry, Frankford; at Elam, Lenni and Morton, Delaware county and at Chester Springs and in East Bradford, Chester county; however, some of the specimens from Elam, sent to me for examination, proved to be lepidomelane. The locality at Weber's, Lower Saucon, Northampton, has long been exhausted (*v. lanthanite*).

CHONDRODITE. 415.

This mineral has been found in the Cambrian limestone at Harvey's quarry, above Chad's Ford, Delaware county.

TOURMALINE. 426.

412: Ball's quarry, Newlin, Chester county.

436: Avondale, Delaware county; black, broken prisms.

	412	436
SiO ₂	36.85	36.82
TiO ₂	1.72	0.69
Al ₂ O ₃	23.98	31.52
Fe ₂ O ₃	11.58	8.30
FeO	4.32	2.47
MnO	5.39	0.72
CaO	1.96	2.43
Na ₂ O	0.36	0.78
K ₂ O	0.18	1.53
B ₂ O ₃	10.85	10.60
H ₂ O	3.51	3.81
	100.68	99.67

APOPHYLLITE. 435.

The St. Peter's mines have produced some very large groups, the *c-a* form modified by *p* [111,1], being the most common; *m* [110,1], and *r* [210*i*-2] have also been observed.

502: St. Peter's, Chester county.

503: Light salmon-pink, with *pyrallolite*; St. Peter's.

314: Clark's quarry, Frankford.

313: Altered variety; McKinney's quarry, Germantown.

	502	503	314	313
G	2.350	2.421	2.381	
SiO ₂	51.63	51.71	52.64	50.12
Fe ₂ O ₃	—	0.57	—	3.91
CaO	25.42	25.02	25.01	23.78
Na ₂ O	—	0.46	—	2.02
K ₂ O	6.27	4.34	5.32	1.07
H ₂ O ^{b.115}			0.28	0.58
H ₂ O ^{a.115}	16.58	17.36	16.46	18.06
	99.90	99.46	99.71	99.54

NATROLITE. 453.

An analysis of a distorted crystal from Lenni, Delaware county, afforded,

G	2.320
SiO ₂	45.92
Al ₂ O ₃	28.15
Fe ₂ O ₃	0.44
CaO	2.48
Na ₂ O	12.28
H ₂ O ^{b.115}	0.34
H ₂ O ^{a.115}	10.90
	100.51

STILBITE. 444.

303: Rockhill, Bucks; small yellow-white crystals.

503: McKinney quarry, Germantown; white radiating crystals

504: Shaft No. 1, St. Peter's; small crystals.

F: Railway cut, east of Reading. (E. F. Smith).

G	303 2.100	503 2.197	504	F 2.120
SiO ₂	54.83	55.10	58.00	54.27
Al ₂ O ₃	16.94	14.18	13.40	17.24
CaO	8.61	9.40	7.80	7.81
MgO	—	—	1.40	—
Na ₂ O	1.26	2.70	tr	1.81
K ₂ O	0.17	0.40	1.03	—
H ₂ O ^{b.105}	2.43	—	—	—
H ₂ O ^{a.105}	15.20	18.60	18.30	19.56
	99.44	100.38	99.93	100.69

CHABAZITE. 447.

211: Clark's quarry, Frankford; yellow-brown.

432: Lenni, Delaware county; Rare!

	211	432
SiO ₂	49.69	48.61
Al ₂ O ₃	18.21	16.15
Fe ₂ O ₃	0.69	3.76
CaO	7.06	8.00
Na ₂ O	3.41	0.40
K ₂ O	0.84	0.29
H ₂ O ^{b.105}	3.50	1.30
H ₂ O ^{a.105}	16.69	21.28
	100.09	99.79

NEW ZEOLITE.

For many years, a specimen has reposed in my collection, as 'undescribed zeolite', having assumed that it was Dr. Genth's mineral (2d. Geol. Sur. Pa. B, 110); however, it is undoubtedly tetragonal, at first sight, resembling the St. Peter's apophyllite. White; translucent; vitreous lustre. B.B. easily fusible, becoming opaque and giving alkaline reaction. Water in tube. H. 4-4.5 G. 2.069. Locality: Fritz Island, Berks county. I have given Doctor Genth's analysis for comparison (G).

	508	G
SiO ₂	39.53	43.36
Al ₂ O ₃	26.38	28.78
CaO	14.89	10.95
Na ₂ O	0.87	0.68
K ₂ O	2.22	1.38
H ₂ O	16.59	15.53
	100.48	100.67

MUSCOVITE. 458.

119: Large crystals; syenite ridge, Easton.

413: Large crystals; Jacob Swayne's farm, Pennsbury, Ches-

509: Large crystals; ter county.

	119	413	509
G	2.879	2.890	2.874
SiO ₂	44.52	43.80	45.18
Al ₂ O ₃	34.02	32.45	33.41
Fe ₂ O ₃	2.51	5.74	3.05
FeO	1.14	1.04	1.07
CaO	0.13	tr	—
Na ₂ O	3.01	2.00	3.00
K ₂ O	9.47	9.79	10.50
H ₂ O	4.72	4.93	4.22
F	tr	—	tr
	99.52	99.75	100.43

CLINOCHLORE. 468.

A most unique specimen in my collection, is a prism with elongated m_0 94^{mm} this face showing a perfect plane for 43^{mm} and distorted to 65° for 51^{mm} a triangular termination of 18^{mm}

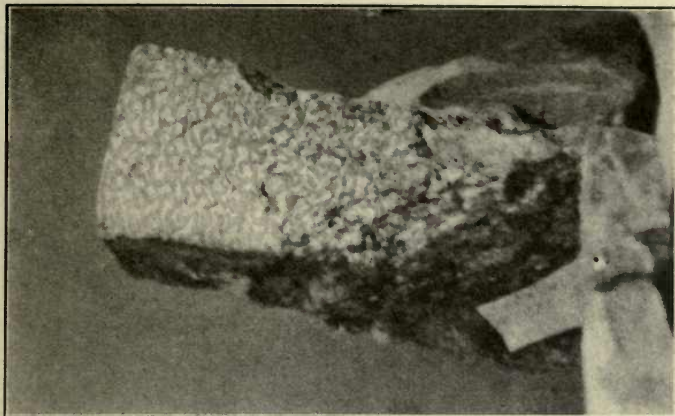
This specimen was found at Birmingham Chester county and in his letter of transmissal Mr. Charles Pennypacker says

"This is the crystal about which Mr. Dana (J.D.) had a question as to whether it or the larger one should be figured"

BIOTITE. 462.

510: Silver-white; the old 'Water Lot', Chestnut Hill,

511: Darker; Easton.



Andalusite. Middletown, Delaware Co.



Muscovite. Easton.

Clinocllore.
Birmingham, Chester Co.

80: Light brown; west Chestnut Hill, Easton.

81: Brown, resembling muscovite; Syenite ridge, Easton.

104: *Eastonite*; altered biotite; light green; Chestnut Hill.

	510	511	80	81	104
G	2.712			2.881	
SiO ₂	41.07	40.32	41.12	40.11	42.37
Al ₂ O ₃	23.34	17.60	17.23	18.03	12.27
Fe ₂ O ₃	4.35	4.30	3.14	5.80	0.92
FeO	—	15.01	—	—	0.60
CaO	—		0.89	0.46	0.24
MgO	23.00	14.40	24.00	24.79	30.15
Na ₂ O	1.60		0.42	tr	1.58
K ₂ O	6.30		9.50	10.50	1.95
H ₂ O	0.26		3.56	0.25	9.99
F	tr		tr		
	99.92		99.86	99.94	100.07

LEPIDOMELANE. 462^B

An analysis of black plates from the gneiss of Clark's quarry, Frankford, resulted.

	206
SiO ₂	40.95
TiO ₂	4.98
Al ₂ O ₃	17.44
Fe ₂ O ₃	1.38
FeO	18.48
MnO	tr
MgO	3.61
Na ₂ O	2.60
K ₂ O	6.78
H ₂ O	3.05
	99.27

PROCHLORITE. 467.

Two altered specimens from west Chestnut Hill, Easton, have been analyzed: blue-green (512) and light green (513): also

also, one by F. A. Genth, jr. from the Dana farm, near Morrisville, Bucks, resulting from the alteration of albite (H).

	512	513	H
G	2.603	2.533	
SiO ₂	33.96	34.01	25.98
Al ₂ O ₃	14.41	15.74	21.08
Fe ₂ O ₃	—	—	3.72
FeO	3.81	5.70	19.96
CaO	0.12	0.14	—
MgO	34.20	31.20	18.29
H ₂ O	12.60	12.69	11.58
	99.10	99.48	100.61

VERMICULITE. LENNILITE.

I have analyzed several specimens of the so-called *lennilite*, found at Lenni, Delaware county, the average being,

SiO ₂	37.53	MnO	0.51
TiO ₂	0.24	CaO	5.76
Al ₂ O ₃	2.16	MgO	32.42
Fe ₂ O ₃	2.61	Na ₂ O	0.03
FeO	1.56	K ₂ O	0.37
Cr ₂ O ₃	0.26	H ₂ O	16.39
			99.84

STILPNOMELANE. 474.

This interesting mineral has been found at Huntingdon Valley station, Montgomery county.

SERPENTINE. 481.

Nos. 82 to 166 are Easton localities.

82: Very light green. Delaware river quarry.

89: Dark oily green.; same locality.

179: *Precious*; Williams' Bushkill quarry.

230: Dark oily green. Williams' Delaware quarry.

290: White; resembling the so-called Delaware meerschaum.

469: *Thermophyllite*; Delaware river quarry.

514: Verdolite quarry; altered.

165: *Porcellophite*: green; Delaware river quarry.

351: Light pea-green; Cornwall, Lebanon county.

419: *Precious*; light green to pale yellow; Leslie farm, Newlin.

422: Green to grayish black; Edward's quarry, Willistown, Chester county.

515: So-called meerschaum; Middletown, Delaware county.

	82	89	179	280	390	469
G	2.517	2.417	2.793	2.487	2.363	2.718
SiO ₂	45.23	44.77	42.44	43.28	44.21	39.83
Al ₂ O ₃	—	—	1.13	—	2.72	6.39
Fe ₂ O ₃	—	0.51	0.26	—	—	—
FeO	3.61	4.77	1.69	2.50	0.52	1.71
CaO	—	—	0.23	0.23	0.26	0.07
MgO	39.59	45.09	41.45	42.55	40.55	39.92
Na ₂ O	—	—	—	—	—	1.11
H ₂ O ^{b105}	0.20	—	0.20	0.43	0.41	0.20
H ₂ O ^{a105}	11.40	4.96	12.50	11.01	12.02	10.23
	100.03	100.10	99.90	100.00	100.69	99.46
	514	166	361	419	422	515
G		2.510	2.559		2.610	
SiO ₂	41.68	42.87	42.11	40.23	36.59	44.58
Al ₂ O ₃	11.33	0.26	—	1.01	tr	tr
Fe ₂ O ₃	3.47	—	—	2.43	8.84	—
FeO	0.33	2.35	5.47	3.50	1.05	2.13
MnO	0.80	—	—	—	—	—
CaO	tr	1.04	0.68	—	—	—
MgO	37.75	40.40	37.80	41.10	38.85	39.55
Na ₂ O	—	—	—	—	1.46	—
H ₂ O ^{b105}	—	—	0.51	0.45	0.25	—
H ₂ O ^{a105}	4.55	12.98	13.62	11.09	13.16	12.91
	99.91	99.90	100.19	99.81	100.20	99.17

At Easton, there is an interesting deposit of serpentine, confined, mainly, to a fault between pre-Cambrian gneiss-syenite and dolomitic limestone; this locality is all the more interesting as exhibiting the various stages of alteration, from the limestone-gneiss-amphibole to serpentine; pseudomorphs predominate.

While the percentage of silica is usually constant, the iron, alumina and magnesia vary as the process of alteration has advanced.

The varieties observed are *precious*, *retinalite*, *porcellophite*, *bowenite*, *williamsite*, *marmolite*, *Thermophyllite*, *chrysotile*.

The Philadelphia-Bryn Mawr serpentine is derived, not from dolomite, but from peridotite. (F. Bascom).

Some of the Wood's mine *picrolite* is nothing but a mixture of calcite and chromium and nickel oxides.

DEWEYLITE. 482.

An analysis of a massive, white, jasper-like specimen from 'The Hunt', Delaware county, afforded,

	315
SiO ₂	42.29
Fe ₂ O ₃	1.92
MgO	39.90
H ₂ O b.115	1.92
H ₂ O a.115	14.24
	100.27

PIMELITE.

Dr. E. Goldsmith has analyzed some impure material of apple green color and very finely micaceous, found on the Rand farm at Radnor, Delaware county.

SiO ₂	45.93
MgO	34.44
NiO	7.69
H ₂ O	11.68
	99.74

GENTHITE. 483.

This beautiful mineral has been found at the Rose quarry, in Lower Merion, Montgomery county, south of Woodlane.

TALC. 484.

The so-called indurated talc from Black Horse, Delaware county is probably a mixture, the average composition being, silica-57.54, ferric iron-7.08, magnesia-28.00, water-5.38.

ALLOPHANE. 498.

This hydrous manganese-aluminum silicate has been found in damourite at Brown's limonite mine, Ironton, Lehigh county.

NEW CLAY

I have found a hydrous manganese-aluminum silicate at the Sampson limonite mine, Cedarville, Easton, where it occurs as a brownish pink clay; an analysis afforded me

SiO ₂	23.23
Al ₂ O ₃	9.71
Fe ₂ O ₃	4.85
MnO	42.15
CaO	2.91
H ₂ O a.115	0.60
H ₂ O b.115	16.55
	100.00

URANOPHANE. 503.

This uranium silicate has been found at Olney Ave. and near Logan, Philadelphia, and at the Leiper quarry, Avondale.

APATITE. 549.

An analysis of light green material, in pink orthoclase, found at McKinney's quarry, Germantown, resulted,

	429
G	3.165
P ₂ O ₅	41.15
CaO	54.15
Al ₂ O ₃	0.10
Fe ₂ O ₃	0.42
Na ₂ O	0.07
K ₂ O	0.33
F	3.35
Insol	0.09
	99.66

COLUMBITE. 525.

Columbite is occasionally found at Broad and Olney streets, and at Logan, Philadelphia, and at Morton, Mineral Hill and Boothwyn, Delaware county.

EUXENITE. 534.

Many years ago, Doctor Kunz sent me a specimen which had been found 'near Philadelphia'; upon examination, I found it to be the rare mineral euxenite, new to the State, but unfortunately, I have never been able to discover the exact locality. Law and Wherry *On a Rare Occurrence in Delaware Co. Penn.* (Min. Coll. 1907, 33), describe "two peculiar black crystals," which they conclude are euxenite. The locality is a pegmatite dike at Johnson's gneiss quarry, near Morton, Delaware county; this is very likely the source of my crystal.

XENOTIME. 536.

This rare mineral has been found near Olney Ave. and at Logan, Philadelphia, and in the feldspar pits at Boothwyn.

MONAZITE. 537.

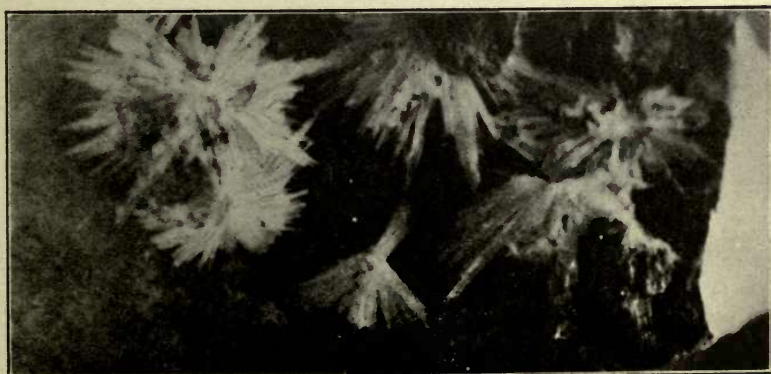
Occasionally found at Morgan's station, Chester creek, and at the feldspar pits near Boothwyn, Delaware county.

PYROMORPHITE. 550.

I have found this phosphate in cavities in galena at the Upper Salford mine, Montgomery county.

As an analysis of the Wheatley mine pyromorphite appears never to have been recorded, I give one made by me several years ago.

	437
G	6.910
P ₂ O ₅	15.19
As ₂ O ₅	tr?
PbO	80.65
Cl	2.60
CaO	0.11
FeO	0.88
Cr ₂ O ₃	tr
	100.14



Barite. Perkiomen Mines, Montgomery Co.

DESCLOIZITE. 564.

This rare species was occasionally found at the old Wheatley mine, and is represented in my collection by a single specimen, a brownish black incrustation on decomposed gneiss.

ERYTHRITE. 601.

This beautiful mineral occurs at shaft No. 1, St. Peter's Chester county, as a thin rose-colored coating on *pyralloolite*.

WAVELLITE. 639.

I have found this phosphate at the limonite mines near Heltown, Northampton county; also at Orbisonia, Huntington, and at Mount Holly Springs, Cumberland county.

TORBERNITE. 659.

AUTUNITE. 661.

I have found these uranium minerals at the Trexler mica mine Stony creek, Berks county, and autunite, on the red shale at Mauch Chunk, Carbon county.

CHALCANTHITE. 755.

I have, in my collection, a specimen of native blue vitriol from the Wheatley mine, Phoenixville.

EPSOMITE. 748.

An analysis of this hydrous sulphate, as an efflorescence on the rocks at Lafayette, Montgomery county, afforded me,

SO ₃	31.39
FeO	7.77
MgO	11.40
CuO	tr
H ₂ O	49.40
	99.96

BARITE. 719.

Barite was formerly mined near Buckmanville, Upper Makefield, Bucks, and the product sent to Easton, for use as an adulterant in the manufacture of paint; small tabular crystals

are still to be found at the openings; a massive variety, resembling anhydrite, is found at the Hinter quarry, Plymouth tsp. Montgomery. Crystals, with the zinc-lead ores of Sinking Valley, Blair connty. The beautiful specimens in my collection from Perkiomen consist of tufts of needle-like crystals 12 to 15^{mm} long; they probably came from the Ecton section.

ALUNOGEN. 775.

An analysis of fairly pure material from School lane, Germantown, resulted,

SO ₃	36.11
Al ₂ O ₃	15.71
FeO	2.59
H ₂ O	45.00
	99.41

GLOCKERITE. 792.

An analysis of glockerite from the schist at Ridge avenue and School lane, Germantown, afforded me,

SO ₃	17.83
Fe ₂ O ₃	60.73
H ₂ O	21.00
	99.56

BISMUTHINITE. 29.

Occurs sparingly at the Leiper and Lewis quarry, Avondale, Delaware county.

MOLYBDENITE. 34.

I have found a considerable quantity of plated molybdenite, in precious serpentine, at the Williams' Delaware quarry, and at Wagener's Chestnut Hill quarry, Easton,

BORNITE. 78.

Professor Dana mentions the occurrence of bornite at Wilkes-Barre; some years ago, a specimen, so labeled, came into my possession, and upon examination, proved to be galena with a coating of copper sulphide, and without doubt came, not from Wilkes-Barre, but from the Ecton mine, Perkiomen.

SCHEELITE. 814.

I have analyzed some crystals found penetrating quartz at the Hoffman quarry, Frankford.

	434
G	6.090
WO ₃	79.90
MoO ₃	2.39
CaO	18.11
	100.40

It occurs, also, in the piedmontite of South mountain.

BOURNONITE. 136.

In his report on the Pennsylvania Lead Cos' mines, Hoofstet-
tin mentions the occurrence of bournonite at the Wheatley mine

TETRAHEDRITE. 148.

This mineral has been found in minute crystals at the Bam-
ford zinc mine, Lancaster county.

TURGITE. 255.

Turgite, as a beautiful red incrustation, is found on the inter-
ior surface of limonite geodes at the Glendon, Easton, mines*
an examination of the turgite from D. Hinter's mine, White-
Marsh, Montgomery county,† proves it to be a very hydrous
limonite.

	103*	428†
Fe ₂ O ₃	86.41	78.01
MnO	8.60	3.61
SiO ₂	—	1.21
H ₂ O	5.06	17.64
	100.07	100.57

SMITHSONITE. 275.

This beautiful and very important zinc ore is found with cala-
mine, sphalerite and galena at the Sinking valley mines, Blair.

CERUSSITE. 281.

An argentiferous cerussite has been reported from a locality
on Clearfield creek, Clearfield county. Doubtful!

LANTHANITE. 298.

This rare mineral was reported many years ago from the Friedensville zinc mines, and in 1882, I made a diligent and careful search at this locality, but without success; I have, however, always attributed this rare carbonate to the allanite locality, at Weber's, Lower Saucon, Northampton county, six miles from Easton, and notwithstanding the fact that my frequent exploratory work here has failed to disclose another allanite pocket, I still contend that this locality, and not Friedensville, was the source of the lanthanite.

HYDROMAGNESITE. 300.

This beautiful mineral is occasionally found as a snow-white incrustation on the serpentine of Chestnut Hill, Easton.

ZARATITE. 303.

I have found a single, but quite large, specimen of emerald-nickel, as an apple-green incrustation on altered serpentine, at Williams' Delaware quarry, Easton.

BISMUTITE. 306.

This mineral has been found at the Leiper and Lewis quarry, Avondale, Delaware county.

PYRRHOTITE: Honesdale, Wayne.

FLUORITE: Snyder's quarry, Easton; Wheatley mine; Pine Grove, Cumberland; Bycot, Bucks; Ironton, Lehigh.

MOLYBDITE: Barber's quarry, Frankford.

BINDHEIMITE: Morton, Delaware.

GUMMITE: Avondale and Leiperville.

CARNOTITE: Mauch Chunk. In *Pottsville* conglomerate.

CELESTITE: Raystown, Blair.

CHALCOCITE: Easton; Ecton mine.

SIDERITE: Wharton mine, Hellertown.

PSILOMELANE: Cedarville, Easton; Ironton; Wharton mine Hellertown, Northampton. (*asbolite*).

URANINITE: Crum creek, Avondale, Swathmore, Delaware.

ZINC LEAD AND COPPER ORES

Both these sulphides have been mined at Phœnixville, Perkiomen, New Galena in Bucks, near Sunbury in Northumberland and in Sinking valley Blair; also occasionally at Victor-hollow, Fayette; in the lime at Easton; near Espy, Columbia. Galena, in Harrison tsp. Potter; McConnelstown, Huntingdon Millview, Sullivan; Westfall, Pike and Frystown, York.

The deposit of sphalerite (and calamine) at Friedensville, Lehigh county, has been most successfully operated and unlike the usual structure, the blende is crypto-crystalline of grayish color, not unlike limestone; the maximum thickness is forty feet and has been worked to a depth of several hundred feet along the strike, which dips S 5-10, E 30-35.

The well-known Phœnixville deposits lie at the contact of the Triassic and gneiss; the section is extensively mineralized and a large amount of lead and zinc produced prior to 1860; the output of argentiferous galena to the year 1855 being valued at \$135,000. As the workings deepened the galena diminished and zinc and some copper came in. The main Wheatley vein had twenty inches of galena.

The Ecton mine lies wholly in the Triassic and the intrusions are probably of later origin than the Wheatley; this mine produced some galena and sphalerite, although, in connection with the adjoining Perkiomen mine, it was worked for copper.

Copper, usually as malachite and chrysocolla, is found disseminated throughout the rocks lying east of the Allegheny Mts; Although there has been a large and unjustifiable expenditure of money in exploratory work, apparently, but three mines have ever actually produced: the Cornwall iron banks, the old Schwenksville mine and the Perkiomen group.

The latter group appears to have a true vein system, thereby differing from the usual occurrence as thin films and stains. This mine produced a considerable tonnage of high grade ore, of from ten to twenty-five per cent, copper.

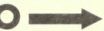
MINERALS AND ROCKS IN PART TWO

<i>Actinolite</i>	Chalcanthite	<i>Lennilite</i>	<i>Schist</i>
Allanite	Chalcocite	Lepidomelane	Serpentine
Allophane	Chondrodite	Limonite	Siderite
<i>Almandite</i>	<i>Chrysotile</i>	<i>Marmolite</i>	Smithsonite
Alunogen	Clay new	Microcline	Sphalerite
Amphibole	Clinochlore	Molybdenite	Stilbite
<i>Andradite</i>	Columbite	Molybdite	Stilpnomelane
Apatite	Cyanite	Monazite	<i>Syenite</i>
Apophyllite	<i>Damourite</i>	Muscovite	<i>Shenite</i>
<i>Asbestos</i>	Descloizite	Natrolite	Talc
<i>Asbolite</i>	Deweylite	<i>Nephrite</i>	Tetrahedrite
<i>Augite</i>	<i>Diopside</i>	Oligoclase	<i>Thermophyllite</i>
Autunite	<i>Eastonite</i>	Orthoclase	<i>Thulite</i>
Barite	Epidote	Pectolite	Topaz
Beryl	Epsomite	<i>Pegmatite</i>	Torbernite
Bindheimite	Erythrite	Piedmontite	Tourmaline
Biotite	Euxenite	Pimelite	<i>Tremolite</i>
Bismuthinite.	Fluorite	<i>Porcellophite</i>	Turgite
Bismutite	Gadolinite	Prehnite	Uraninite
Bornite	Galena	Prochlorite	Uranophane
Bournonite	Garnet	Psilomelane	<i>Vermiculite</i>
<i>Bowenite</i>	Genthite	<i>Pyrallolite</i>	Wavellite
<i>Byssolite</i>	Glockerite	Pyromorphite	Wernerite
Calamine	<i>Gneiss</i>	Pyrrhotite	<i>Williamsite</i>
Cancrinite	<i>Grossularite</i>	Pyroxene	Xenotime
Carnotite	Gummite	Rhyolite	Zaratite
Celestite	Hydromagn'te	Sahlite	Zeolite new
Cerussite	<i>Jade</i>	Scheelite	Zircon
Chabazite	Lanthanite		Zoisite

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